Berkeley Lab and the Clean Energy States Alliance

CASE STUDIES OF STATE SUPPORT FOR RENEWABLE ENERGY

The Experience of State Clean Energy Funds with Tradable Renewable Certificates

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CASE SUMMARY

Case Description

Tradable renewable certificates (TRCs), also commonly referred to as green tags or renewable energy credits (RECs), represent the non-energy attributes of electricity produced from renewable sources. They can be sold independently from or bundled with commodity electricity. Though perhaps most often used as a means of tracking compliance with Renewables Portfolio Standards and verifying wholesale renewable energy transactions more generally, TRCs also provide a green power purchasing option to both residential and non-residential customers.

TRCs offer a simple, transparent verification tool for renewable energy transactions, facilitate liquidity and depth in renewable energy markets, potentially offer a new revenue stream for renewable energy generators, and can facilitate the purchase of green power by end-use customers. As such, TRC verification systems and TRC trading are becoming increasingly popular across the United States.

Several state clean energy funds[1] are exploring their respective roles regarding TRCs, and different states have played widely ranging roles in this emerging market to date. This case study summarizes these activities. The states that are covered include California, Connecticut, Illinois, Massachusetts, Minnesota, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, and Wisconsin.

Innovative Features

State clean energy funds have taken a variety of approaches with respect to TRCs, including:

- Offering financial incentives to companies that sell TRCs directly to end-use customers;[2]
- Funding education campaigns about TRCs;

[1] Clean energy funds exist in 15 states, are typically funded through system benefits charges, and are tasked with promoting the use of renewable energy.

[2] Other states (e.g., California and Connecticut) offer similar support to companies selling bundled green power products that may incorporate TRCs at the *wholesale* level.

- Supporting the development of accounting and verification systems for TRCs;
- Restricting the use or sale of TRCs from funded generators;
- Taking direct title to TRCs based on renewable energy project funding, either by default or by specifically purchasing the TRCs; and,
- Offering renewable energy projects or project intermediaries risk management products that mitigate the potential impact of fluctuations in the value of TRCs.

Results

- ***Offering Financial Incentives to Companies that Sell TRCs Directly to End-Use Customers:*** Five state funds have offered support directly to green power suppliers or marketers that promote the purchase of TRCs, including the Massachusetts Technology Collaborative (MTC), the New York State Energy Research and Development Authority (NYSERDA), the Sustainable Development Fund of Pennsylvania (SDF), the Sustainable Energy Fund of Central Eastern Pennsylvania (SEFCEPA), and the Rhode Island Renewable Energy Fund (RIREF). Support provided to these organizations has ranged from direct financial incentives for TRC sales, to partial funding for the development of business plans.
- ***Funding Education Campaigns about TRCs:*** CCEF provides support to SmartPower, a non-profit organization dedicated to educating consumers about green power, including their options to purchase green power through TRCs. All five Pennsylvania funds contributed to a joint green power consumer education effort promoting the purchase of green power through (in part) TRCs. Though other states have indirectly supported consumer education, for example by funding green power marketers that, by necessity, devote significant resources to educating potential customers, those efforts are not included here.
- ***Supporting the Development of Accounting and Verification Systems for TRCs:*** Three state funds have sponsored the study and/or development of TRC verification and trading systems in their states, including NYSERDA, SDF, and Wisconsin Focus on Energy. In California, the CEC is developing an electronic tracking system, but whether it will track TRCs remains unclear.
- ***Restricting the Use or Sale of TRCs from Funded Generators:*** At least three state funds, though not retaining ownership of TRCs from funded generation projects, do impose specific restrictions on where these TRCs can be sold. Both MTC and RIREF require that TRCs from funded generation projects be sold into their respective states. In Wisconsin, TRCs associated with funded projects may not be sold into an RPS for the first ten years of project operation. Finally, though not imposed directly by the clean energy fund, restrictions also exist in Minnesota, where TRCs from funded projects must be sold to Xcel Energy due to requirements of standard power purchase agreements. In all other instances there are no explicit restrictions on where the TRCs from funded generators can be sold, including whether they can be sold into an RPS. [3]
- ***Taking Direct Title to TRCs Based on Renewable Energy Project Funding:*** Five state funds have sought to own TRCs under varying circumstances. Two of these retain ownership of at least some of the TRCs associated with sponsored projects. The Energy Trust of Oregon (ETO) has until recently required ownership of all tags from projects it has funded. The Connecticut Clean Energy Fund (CCEF) attempts to obtain the TRCs of projects it funds, but does not make this a universal requirement. Though not seeking title to TRCs from projects funded through other incentives, MTC issued a

[3] Though not considered here, some states also restrict TRC sales from green power marketers that they support (e.g., funded green power marketers must use those funds to support the sale of TRCs to in-state consumers).

solicitation in which MTC is to enter into contracts to purchase TRCs on a long-term basis. NJCEP, meanwhile, has issued a solicitation in which it claims TRCs of funded projects only if the project developer defaults on its financing commitment. Finally, the Illinois Clean Energy Community Foundation has recently agreed to purchase and retire TRCs from a new wind project in Illinois as a pilot project.

- ***Offering renewable energy projects or project intermediaries risk management products that mitigate the potential impact of fluctuations in the value of TRCs:*** The market value of TRCs is likely to change over time, and in some regions few purchasers of TRCs have been willing to enter into long-term purchase agreements. To mitigate the risk of TRC price uncertainty, and to encourage longer-term contracting, MTC has offered a range of TRC price risk mitigation products, including put and call options (as well as direct purchases of TRCs, discussed earlier). MTC announced five winning bidders under this solicitation in November 2003. In July 2002, SDF was the first state fund to offer such risk insurance products, but received no interest at that time.

Table 1 summarizes the TRC-related activities of state clean energy funds.

Table 1. Summary of State Clean Energy Fund Activities Related to TRCs[A]

State / Fund	Incentives to companies that sell TRCs	Funding education campaigns about TRCs	Support for TRC tracking systems[B]	Restricting use or sale of TRCs from funded generators[C]	Taking title to TRCs based on project funding	Offering TRC risk management products
CA / CEC						
CT / CCEF		X			X	
IL / ICECF					X	
MA / MTC	X			X	X	X
MN / XERDF				X		
NJ / NJCEP					X	
NY / NYSERDA	X		X			
OR / ETO					X	
PA / SDF[D]	X	X	X			X
PA / MESEF		X				
PA / WPPSEF		X				
PA / SEFCEPA	X	X				
PA / PECSEF		X				
RI / RIREF	X			X		
WI / FOE			X	X		

[A] In addition to those efforts listed in the table, RIREF has offered incentives for large TRC purchasers, MTC has provided funding for the development of a guidebook seeking to help developers of small renewable energy projects certify TRCs through the New England Generation Information System (GIS) and sell them into the market, and NYSERDA has funded other TRC-related studies.
[B] In California, funding has been earmarked for the design of a new electronic green power tracking system, but it remains unclear whether this system will allow tracking of tradable renewable certificates separately from underlying electricity.
[C] TRCs from projects funded through Minnesota's XERDF are required to be sold to Xcel Energy, not through restrictions devised by the clean energy fund, but as a result of standard power purchase agreements.
[D] The five Pennsylvania clean energy funds include the Sustainable Development Fund (SDF), the Metropolitan Edison Sustainable Energy Fund (MESEF), the West Penn Power Sustainable Energy Fund (WPPSEF), the Sustainable Energy Fund of Central Eastern PA (SEFCEPA), and the Pennsylvania Electric Co. Sustainable Energy Fund (PECSEF).

CASE STUDY DETAILS

Background

Tradable renewable certificates (TRCs), also commonly referred to as "green tags" or "renewable energy credits," represent the non-energy attributes (in effect, the *green-ness*) of electricity produced from renewable sources. TRCs can be sold independently from or in conjunction with commodity electricity. This flexibility allows TRCs to be sold anywhere, irrespective of grid connection issues. Though

still a relatively new concept, the importance of TRCs is growing rapidly in the renewable energy industry.

TRCs can be utilized in a variety of ways. Their primary use to date has been by electricity suppliers seeking to demonstrate compliance with state Renewables Portfolio Standard (RPS). More generally, TRCs can be used by organizations to verify wholesale renewable energy transactions, and to substantiate green power claims. In addition, TRCs can be sold directly to customers, through either a utility company or a third-party green power marketer.

Electronically based TRC tracking systems already exist in New England, Texas, and Wisconsin, and are under consideration in numerous other jurisdictions. Even where formal TRC tracking systems are not currently in operation, TRCs are still commonly sold in wholesale and retail markets. This is because TRCs offer a simple, transparent verification tool for renewable energy transactions, facilitate liquidity and depth in renewable energy markets, potentially offer a new revenue stream for renewable energy generators, and can facilitate the purchase of green power by end-use customers. As such, TRC verification systems and TRC trading are becoming increasingly popular across the United States.

State clean energy funds have chosen to play widely ranging roles in the emerging TRC market to date. This case study summarizes these activities (see Table 1 for a brief overview). The states that are covered include California, Connecticut, Illinois, Massachusetts, Minnesota, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, and Wisconsin. Of these, Connecticut, Massachusetts, and Oregon have taken particularly active roles.

In contrast, a few other state clean energy funds have chosen not to undertake activities related to TRCs to date, including the Illinois Renewable Energy Resources Program, the Energy Loan Fund of Ohio, and the Delaware and Montana renewable energy funds. In particular, these funds (as well as others) have not made any claim on the TRCs from projects they have funded, allowing the ultimate system owners (i.e., grant recipients) to own all TRCs associated with each project. In some cases these have been deliberate decisions; in others, TRC issues have simply not yet been sufficiently considered for any action to be taken.

In addition to the individual state activities covered here, several funds in the Clean Energy States Alliance jointly supported the development of a more detailed study, "It's Not Easy Being Green: The Role of Green Tags in Project Finance," in April 2002. This report examined the potential role of TRCs as a revenue source for financing projects, existing trading and accounting mechanisms, and potential roles that state clean energy funds might take in relation to TRCs.[4]

California

In 2003, the California Energy Commission (CEC), administrator of the state's renewable energy fund, recommended that at least $1.35 million be earmarked for the planning and design of a new electronic system capable of tracking and accounting for all renewable energy generated or sold in California, primarily for verifying RPS compliance. (Under the state's RPS, the CEC is responsible for tracking compliance.) This system is intended to be electronic, but whether the California RPS will allow tracking of tradable renewable certificates separately from the underlying electricity remains unclear. The CEC is also working with the Western Governors' Association with the objective of developing a tracking system that can meet the needs of multiple Western states in a coordinated fashion.

Connecticut

[4] For further information, see Eric Oldsman. "It's Not Easy Being Green: The Role of Green Tags in Project Finance." Clean Energy Funds Network. April 2002. http://www.cleanenergystates.org/CaseStudies/GreenTagsandProj.pdf#410B1.pdf

The Connecticut Clean Energy Fund (CCEF) believes that supporting the development of the TRC market can help facilitate the financing and construction of new renewable energy technologies. CCEF also believes that its possession and sale of green tags has the potential to become a valuable revenue stream. CCEF is therefore currently obtaining TRCs from various projects that it funds, with an eye toward selling them into the marketplace to offset the cost of some of its programs.

Projects funded through current RFPs supporting photovoltaic (RFP CCEF-PV-02-001) and fuel cell (RFP CCEF-FC-002) technologies, for example, are and will continue to be providing TRCs to CCEF. Applicants to both RFPs must propose the method by which they will receive funds from CCEF (e.g., grants, loans, equity investments), and are encouraged, though not required, to consider offering TRCs back to CCEF to effectively lower CCEF's potential investment and increase the project's chance of being funded.

CCEF has also provided education to and promoted the purchase of green tags by end-use customers, both through its own website and its support of SmartPower. On its own website, CCEF urges consumers to purchase TRCs, the only green power option currently available for small customers in the state. It provides information about how TRCs are created and why they are important, as well as direct links to several organizations offering TRCs for sale. Along with five other organizations, CCEF has also funded SmartPower, a non-profit organization that promotes the purchase of green power through TRCs. Thus far, SmartPower has had more success promoting green power to the energy managers of municipal and educational organizations than to individual consumers, attributing the difference in part to the complexity of TRC concepts.

Illinois

Through a pilot project, the Illinois Clean Energy Community Foundation has recently agreed to purchase and retire all TRCs from a new 1.65 megawatt wind project in Illinois over a ten-year period. This purchase, designed to improve project financing, will effectively cover ten percent of the project cost.

Massachusetts

Of all of the state funds, Massachusetts has perhaps taken the most active and wide-ranging approach to the market for TRCs.

Through its Green Power Partnership program (solicitation No. 2003-GP-01) launched in May of 2003, the Massachusetts Technology Collaborative (MTC), administrator of the Massachusetts Renewable Energy Trust, is offering to directly purchase TRCs and/or to provide other market price risk hedging products to both generators and purchasers of new renewable energy. This program was developed as a result of the uncertainty surrounding the long-term value of TRCs, and a lack of longer-term contracting for renewable energy in New England. By providing a degree of market price protection for TRCs, MTC hopes to encourage the establishment of long-term contracts for renewably generated commodity electricity and TRCs. Financed projects must be located in New England and serve Massachusetts ratepayers (verified through NEPOOL). MTC intends to re-sell all TRCs it purchases into the market to provide additional revenue for future activities.

Four types of offerings are available under the Green Power Partnership solicitation:

1. *Purchase contracts*, wherein MTC agrees to purchase TRCs from the proposer at a set per-unit price over the term of the contract.
2. *Put Option contracts*, wherein the proposer, after paying an initial option premium to MTC, has the right to sell TRCs to MTC at a set per-unit price. Put Option contracts effectively establish a guaranteed floor price for TRCs.
3. *Put Back Option contracts*, a variation of the Put Option contract, wherein the proposer typically pays a lower

option premium, retains the right to sell TRCs at a set price to MTC, but also grants MTC the right to sell any of these TRCs back to the proposer at a price below that which MTC paid for them. This option thus requires the proposer to retain some of the TRC price risk in exchange for a lower initial premium.

4. *Price Collar contracts* (also referred to as "Put and Call Option" contracts), wherein MTC gives a Put Option to the proposer at no cost in exchange for the right to purchase (or call) TRCs from the proposer. Any TRCs called by MTC would be bought from the proposer at a set per-unit price higher than that which MTC would have to pay if the proposer chose to sell the TRCs to MTC. Such a contract establishes a firm floor and ceiling for the price of TRCs.

All contracts established under the Green Power Partnership solicitation are limited to a maximum of 10 years, divided into separate 12-month option terms. Though eligible projects must commence operation by the end of 2005, contracts established under this solicitation may apply to any years through 2020. Thus, for example, TRCs from a new project could be sold into the market through 2010, at which time a pre-negotiated contract with MTC could kick in through 2020, reducing long-term risk and thereby facilitating the obtainment of financing.

To reduce uncertainty in the process, Put Options must be exercised by the proposer at least four months prior to the commencement of any given 12-month period, while Put Back and Call Options must be exercised by MTC no less than three months prior to the commencement of any applicable option year. In addition, the proposer may arrange to sell TRCs into the market for terms of five or more consecutive years and receive a refund of option premiums associated with those TRCs.

In November 2003, MTC announced $32 million in initial funding commitments through this solicitation, supporting five projects expected to generate close to 100 megawatts of green power. The resulting projects utilize all four offering types listed above, as well as a range of energy sources (wind, hydro, biomass, and landfill gas). MTC hopes to recoup a substantial portion of its funding commitment through the resale of TRCs, and is planning at least one additional similar solicitation in 2004.

Beyond the Green Power Partnership, MTC has also played an active role in other aspects of the TRC market.

First, through the "Emerging Technology Demonstration Solicitation" (No. 2003-GP-02), released in May 2003, MTC provides incentives of up to $500,000 to support emerging renewable energy technologies: those showing promise but not yet fully commercially developed. A total of $2 million is available through grants under this solicitation. Awardees must commit to sell all TRCs from resulting projects to Massachusetts customers for a ten-year period. If another state also provides funding for a portion of project costs, a percentage of the project's TRCs in proportion to the funding provided by MTC must be sold to MA customers.

In similar fashion, MTC also imposes restrictions on the sale of TRCs from projects funded through its "Pre-Development Financing Solicitation" (No. 2004-GP-03), released in October 2003. Under this solicitation, a total of $2 million is available for feasibility studies (up to $50,000 per project) and other pre-development activities (up to $250,000 per wind project; $150,000 for other projects). To ensure a benefit to Massachusetts ratepayers, MTC requires that at least 30% of TRCs associated with funded projects be sold into the Massachusetts market for the first ten years of each project's operation. Higher percentages are encouraged.

Third, through the "Consumer Aggregation Planning Grants Solicitation" (No. 2001-CA-01), which closed in the spring of 2001, MTC provided funds for consumer aggregation

programs aimed at increasing the purchase of green power by end-use consumers, including via TRCs. MTC offered grants of up to $150,000 under this solicitation, for a total of up to $750,000. Only governmental and non-profit organizations were eligible to apply for funding (though aggregations could include all customer types), and awardees were required to share at least 25% of the cost.

Fourth, MTC is also slated to play an important role in the implementation of the state's RPS. Utilities needing additional renewable energy in their portfolios to come into RPS compliance are able to meet that shortfall by paying MTC $50 for each MWh of renewable energy shortfall. MTC will then use the proceeds of these "alternative compliance payments" to purchase offsetting TRCs through an auction, and will subsequently retire those TRCs.

Fifth, MTC has provided funding for the development of a guidebook intended to help PV system owners and installers understand the process of certifying TRCs from their projects through the New England Generation Information System (GIS) and selling them either independently or through green power marketers or aggregators. This guidebook is currently under development.

Finally, MTC is also in the process of developing the Clean Energy Choice Program, aimed at enabling consumers to purchase green power through their existing electric service providers. Through utility companies choosing to partner with this program, consumers will be able to receive TRCs, verified by an escrow agent, in return for tax-deductible donations to the program.

Minnesota

To date, the Xcel Energy Renewable Development Fund (XERDF) has not chosen to take an explicit role in relation to TRCs. However, all energy production projects funded through XERDF must sell their output to Xcel. Under the standard power purchase agreement established by Xcel, Xcel retains rights to all environmental attributes, including TRCs. This allows Xcel to count these TRCs toward any future state or federal RPS, or sell or trade them in the marketplace.

New Jersey

The New Jersey Clean Energy Program (NJCEP) recently released a $50 million solicitation supporting the development of distributed renewable electricity generation projects in New Jersey. According to the solicitation, all TRCs resulting from funded projects will remain the property of the project developer. However, ownership of the TRCs will revert to NJCEP if the developer defaults on its financing commitment.

New York

NYSERDA has also been an active participant in the TRC market.

Under Program Opportunity Notice (PON) 607-01, "Environmental Attribute Accounting and Trading System," which closed in the fall of 2001, NYSERDA solicited proposals for the development of a system that would track and facilitate the sale of TRCs generated in New York, as well as allow for transactions with other systems (e.g., NEPOOL). Through the Exploratory Phase of this initiative, two organizations were awarded up to $50,000 each (with a 50% cost-share) to develop concepts of how such a system could be created and business plans for its implementation. Though the PON called for one of these organizations to be subsequently awarded up to an additional $500,000 (with a 50% cost-share to be recouped) to build and deploy the system, this phase has been delayed by RPS discussions in New York likely to further influence the system's development.

NYSERDA has also offered support for marketers of TRC-based products to end-use consumers. Under PON 599-01, "Green Marketing Support Programs," which also closed in the fall of 2001, NYSERDA awarded contracts exceeding $1,000,000 to firms to develop and implement marketing plans to spur the consumption of green power by retail consumers in New York State. Organizations seeking to market TRCs were

eligible in addition to those selling electricity bundled with environmental attributes. In a second round of this program (PON 731-02, "Green Marketing Incentives Program"), NYSERDA also provided incentives to organizations for the sale of qualified green power products to consumers. NYSERDA awarded three contracts for over $2,700,000 for the first year of what is planned to be a five-year marketing program. The renewable energy supply under this program is supported by "conversion transactions," a limited variant to TRCs.

In addition, NYSERDA has recently conducted two studies of relevance to the TRC market. The first evaluated issues associated with cross-border trading of TRCs, including approaches to accounting for and verifying TRC import and export transactions, as well the development of compatible information systems. The second study featured an evaluation of the potential for wind power projects to provide a hedge against retail electric rate volatility, and included a brief discussion on the potential for TRC products to be used for this purpose.

Oregon

The Energy Trust of Oregon (ETO) has placed a unique degree of emphasis on obtaining and retaining ownership of TRCs from all projects that it sponsors. Although ETO is in the process of re-evaluating its policies, it is currently the only fund to require ownership of virtually all TRCs from all funded projects. Unlike other funds that retain some degree of TRC ownership in some cases, ETO's motivation has not been driven by a view of TRCs as a potential revenue source. Rather, ETO has thus far taken the position that retaining ownership is a necessary step in providing verification that it is meeting its mandate to deliver the long-term benefits of renewable resources to Oregon ratepayers.

For example, ETO required title to all TRCs associated with projects funded through a 2002 RFP, "Pacific Northwest Wind Generation," which offered incentives totaling up to $8.5 million for new wind projects in Oregon. Under this solicitation, for the duration of each PPA, TRCs will be passed from ETO to the Oregon utilities in proportion to the amount of electricity each utility purchases from funded projects. The utilities will subsequently retire the TRCs on behalf of their ratepayers. The first project funded through this solicitation was a 41 megawatt wind farm scheduled to begin operation by the end of 2003. ETO contributed $3.8 million to this project, and will pass all of its TRCs to PacifiCorp, which agreed to purchase the wind farm's power for 20 years.

ETO's Solar Electric Program has also required that the environmental attributes of all systems funded by ETO remain the property of ETO for the 20-year term of the agreement. Homeowners are thus able to claim that they are facilitating the production of their systems' environmental attributes, but they may not claim to be using green power themselves. Because of this, participating PV system owners are unable to take advantage of the additional revenue available from selling TRCs to the Bonneville Environmental Foundation, which has established a business model that includes purchasing TRCs from customer-sited PV in Oregon.

However, a recent solicitation under the Solar Electric Program offering incentives for solar electric demonstration projects of five kilowatts or more provides additional flexibility. Though still retaining title by default to TRCs from projects funded through the 2003 "Large-Scale Community Demonstration Project Opportunity for Public and Non-profit Organizations" RFP, ETO does provide a mechanism for project developers to sell TRCs to other parties instead. According to the RFP, TRCs may be retained by the project owner or sold to another party so long as the final purchaser is willing to identify ETO's support for the project and can demonstrate that benefits flowing from the sale of the TRCs will translate to benefits to the public at large.

ETO is in the process of re-evaluating its policies and is moving toward taking only a

"risk-adjusted" proportion of the TRCs based on its share of funding for each project's above-market costs. ETO has piloted this approach with two recent photovoltaic projects, wherein it retains an amount of TRCs proportional to its contribution to the systems' incremental costs, yet also works with project developers to creatively determine how that amount will be retained. In one example, ETO will own all of the TRCs in years 6 to 20 while a green power marketer owns them in the first five years. In the second pilot project, ETO owns all TRCs for the first 15 years and the project sponsor is free to market all TRCs after that.

Pennsylvania

The five clean energy funds operating in Pennsylvania have undertaken a variety of roles related to TRCs, ranging from support for green power marketers to public education efforts. None of these funds restrict where TRCs associated with projects that they fund can be sold. Together they have contributed, along with a large number of other renewable energy businesses, non-profit organizations, and federal and state agencies, to a joint green power consumer education effort. This campaign, sponsored by the Mid-Atlantic Renewable Energy Coalition and managed by PennFuture, promotes the purchase of green power through (in part) TRCs.

Two of the five Pennsylvania funds, the Sustainable Development Fund (SDF) and The Sustainable Energy Fund of Central Eastern Pennsylvania (SEFCEPA), have contributed funding to Community Energy (CEI), an aggressive green power marketer based in the state. SEFCEPA's commitment to CEI has included a $250,000 line of credit, $150,000 of royalty financing to hire additional sales personnel, and a $250,000 equity investment for a 5% position in the company.

SDF also took an innovative step in July 2002 as the first clean energy fund to offer a form of green power (or TRC) price insurance through its Phase III solicitation of the Pennsylvania Wind Development Program. Applicants were able to choose price insurance from a list of incentive types and propose the magnitude and structure of the incentive. However, SDF received no applicants requesting the insurance offering.

In addition, SDF provided $25,000 to a consultant for the development of a business plan for tracking and verifying TRCs in Pennsylvania.

Rhode Island

The Rhode Island Renewable Energy Fund (RIREF) has integrated TRCs into a few of its programs aimed at facilitating the generation and sale of new renewable energy to Rhode Island customers.

Through the "Solar Photovoltaic Funding Opportunity for Commercial, Industrial and Institutional Buildings" RFP, released in July 2003, RIREF requires that at least 25% of TRCs generated by funded projects remain the property of the project host. The RFP, which provides incentives for the installation of large (>5kW) PV projects in Rhode Island, allows that some or all of the remaining TRCs may be retained by the host as well. However, the RFP encourages projects to certify through the New England GIS a portion of the remaining TRCs, and make those TRCs available for sale to the green power market. This may involve the host selling the TRCs directly to end-use customers or TRC marketers, or instead providing the TRCs to the state energy office, which will in turn sell them through green power or green tag marketers or dedicate them as state purchases. According to the RFP, the proposed usage of resulting TRCs will be a factor in the project selection process.

RIREF's Residential and Small Business Customer Incentive Program provides registered retail electricity suppliers with a per-customer rebate for signing up residential and small business customers in Rhode Island to purchase green power, including through the purchase of TRCs. The program has been funded at $1.36 million and aims to reach 15,000 customers. To be eligible under this program, TRCs must meet minimum levels of supply from new (post January 1, 1998)

renewable resources located within New England. Eligible TRCs must also either be certified through the Green-e program or be structured as block products providing at least 150 kWh per month of electricity from New England sources. In addition, TRCs sold through the Narragansett Electric Company's (NEC's) GreenUp Program are also eligible for these incentives, provided they constitute at least 50% of a given customer's electricity use. The GreenUp program enables existing NEC customers to sign up to purchase TRCs from 3rd party vendors through their NEC electric bills and without switching to a new electric service provider.

RIREF also included incentives for TRC-related projects under two additional complementary green power RFPs released in 2002. In both cases, resulting TRCs were required to be sold into the Rhode Island market. Through the "Purchase and Sale of Renewable Electricity to Large Electricity Customers" RFP, both large green power purchasers and sellers, including those buying or selling TRCs, are eligible for applicant-proposed incentives. This RFP remains open through the end of 2003 and offers a total of $420,000. RIREF also allows sellers of TRCs to apply for incentives under the "2002 Renewable Generation Supply" RFP. This solicitation requires applicants to propose a production incentive for a specified amount per kWh produced over a specified term and up to a total cap. The RFP does stipulate that the incentive may not exceed 3 cents/kWh and the term may not exceed five years. However, RIREF has accepted an alternative proposal in response to this RFP from a green power marketer by which the fund has agreed to purchase TRCs from a wind project and sell them to the marketer at a reduced price.

Wisconsin

The Public Service Commission of Wisconsin recently launched the Wisconsin Renewable Resource Credit (WIRRC) program, responsible for overseeing the tracking, trading, and verification of TRCs used for RPS compliance in the state. Wisconsin Focus on Energy provided one-time start-up support for the initial cost of hiring an administrator to build and operate a web-based system for the WIRRC. In the future it is expected that the WIRRC program will support itself through charges associated with TRC volume.

Wisconsin also places some restriction on the sale of renewable attributes (TRCs or renewable electricity) from projects funded through the Wisconsin Focus on Energy (WFE) program. Renewable attributes associated with these projects may not be sold for the purposes of RPS compliance for a period of ten years from the date of WFE's incentive payment.

Lessons Learned

The sale of TRCs can clearly provide a new revenue stream for renewable energy project owners, improving project economics. TRC markets are likely to be most robust in states in which an RPS exists. However, effective green power marketers selling TRCs to end-use customers can also heavily influence the development of state green power markets and facilitate new green power generation by causing a demand pull. And yet, the market for TRCs is nascent – mechanisms for verifying and tracking TRCs have only been developed in certain areas of the country, and have generally not yet been linked together allowing for a national trading system.

We find that states are continuing to refine their roles in the TRC market, and have taken very different roles related to TRCs to date. Non-interventionist / facilitating roles include: (1) studies, and (2) helping to pay for tracking systems. More active roles include: (1) helping to fund TRC marketers and performing TRC education, and (2) directing that TRCs must be sold in state. Even more active roles include: (1) taking title by default or purchase of TRCs, and (2) offering risk insurance products.

Differing interpretations exist as to whether state clean energy funds need to retain TRCs associated with projects they sponsor in order to claim they're delivering green power to state ratepayers. Those states that have taken title to TRCs have varied in their approach to

the amount of TRCs they claim from funded projects (i.e., all vs. a portion based on the state's contribution to the project). Such states also have different motivations for taking title to TRCs (without *specific* purchase): (1) to ensure that the benefits of green power are being retired on behalf of end-use customers in the state (e.g., Oregon), (2) to provide supplemental revenue to the fund through re-sale of the TRCs (e.g., Connecticut), or (3) to protect against the possibility that project developers will default on their financial commitments (e.g., New Jersey).

In still other cases, states have purchased TRCs (e.g., Massachusetts, Illinois, and Rhode Island) or offered risk insurance products (e.g., Massachusetts and Pennsylvania). These efforts have been motivated by a desire to directly support renewable projects through the purchase of TRCs and to facilitate project financing by protecting against fluctuations in the value of TRCs. One of the most innovative developments on this score comes from Massachusetts, where a recent solicitation by MTC offers a range of TRC price insurance products. Other states facing barriers to longer-term TRC contracting would be well served to follow the results of the Massachusetts solicitation closely.

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ABOUT THIS CASE STUDY SERIES

A number of U.S. states have recently established clean energy funds to support renewable and clean forms of electricity production. This represents a new trend towards aggressive state support for clean energy, but few efforts have been made to report and share the early experiences of these funds.

This paper is part of a series of clean energy fund case studies prepared by Lawrence Berkeley National Laboratory and the Clean Energy States Alliance. The primary purpose of this case study series is to report on the innovative programs and administrative practices of state (and some international) clean energy funds, to highlight additional sources of information, and to identify contacts. Our hope is that these brief case studies will be useful for clean energy funds and other stakeholders that are interested in learning about the pioneering renewable energy efforts of newly established clean energy funds.

Twenty-three total case studies have now been completed. Additional case studies will be distributed in the future. For copies of all of the case studies, see:
http://eetd.lbl.gov/ea/ems/cases/ or http://www.cleanenergystates.org/

ABOUT THE CLEAN ENERGY STATES ALLIANCE

The Clean Energy States Alliance (CESA) is a non-profit initiative funded by members and foundations to support the state clean energy funds. CESA collects and disseminates information and analysis, conducts original research, and helps to coordinate activities of the state funds. The main purpose of CESA is to help states increase the quality and quantity of clean energy investments and to expand the clean energy market. The Clean Energy Group manages CESA, while Berkeley Lab provides CESA with analytic support.

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